

How coronavirus disease 2019 entered Africa and the Middle East: a case study from Egypt

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Background: We report the first person with SARS-CoV-2 in Egypt.

Methods: We interviewed the index case and contacts.

Results: The 36-year old man was healthy when he traveled on business to Wuhan, China in January 2020. Upon his return to Cairo, he became ill, went to work, and subsequent autochthonous viral spread occurred.

Conclusion: We linked SARS-CoV-2 importation to global business travel. The extent to which physical distancing, hand/face/surface hygiene, mask use, viral testing/contact tracing, restricted travel, small gatherings, and/or stay-in-residence mandates will be implemented and limit further spread in the Middle East and North Africa remains to be seen.

Keywords: COVID-19, Egypt, SARS-CoV-2, epidemiology, transmission, outbreak

Introduction

We investigated what we believe to be the first severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) case to emerge in Egypt, a crossroads of the Middle East and Africa. Our presumptive case and confirmed cases represent among the earliest regional cases outside of Iran.^{1–4} This case study illuminates global transmission dynamics and suggests how quickly infection can spread, even between countries that have relatively few non-stop flights between them.⁵

Earliest cases in Egypt

A healthy 27-year-old Egyptian woman, Ms A, worked as a translator for two Chinese managers of a Japan-based designer brand whose manufacturing capacity is in China. The first manager was a 54-year-old female, Ms B, with business duties in multiple African countries. The second manager was a 36-year-old male, Mr C, with responsibility for the Egyptian market. Both managers and Ms A travelled on business to China from 5 to 18 January 2020 (Figure 1). Ms A and Ms B were in Guangzhou while Mr C went to Wuhan. The three travellers reunited on 18 January in Guangzhou for their return trip to Egypt. On 19 January, Mr C went to his workplace in Cairo with severe influenza-like symp-

toms, including fever and cough. Despite his obvious illness, Mr C worked in the office the whole day, sharing a workspace with three employees, including Ms A and a third Chinese manager, Mr D, age 37 years. On 20 January 20, Mr C was still ill with respiratory symptoms and fever and he isolated himself, given his history of recent travel to Wuhan. Ms B shared the same dwelling as Mr C and Mr D, but all three occupied different rooms. Ms B secured a service to disinfect the home and change the furniture, given the illness of Mr C. On 24 January 24, Ms B developed a fever, cough and sore throat, suggesting a respiratory illness. Mr D then fell ill with respiratory disease on an unspecified date. Ms A remained asymptomatic. In late January there were no coronavirus disease 2019 (COVID-19) diagnostic tests available in Egypt. Ms B and Mr C returned to Guangzhou on 4 February 2020. Mr C recovered completely but Ms B suffered from persistent cough and was confirmed as a COVID-19 case on 11 February based on a reverse transcription polymerase chain reaction test in China. It seems likely that both Mr C and Ms B were the first COVID-19 cases in Egypt, although they were never registered in Egypt as cases, given their return to China.

Also on 11 February, the Cairo office was informed by their China office colleagues that all exposed employees should be tested for SARS-CoV-2. Mr D, Ms A and about 22 other employees received complete blood counts, chest X-rays and nasal and

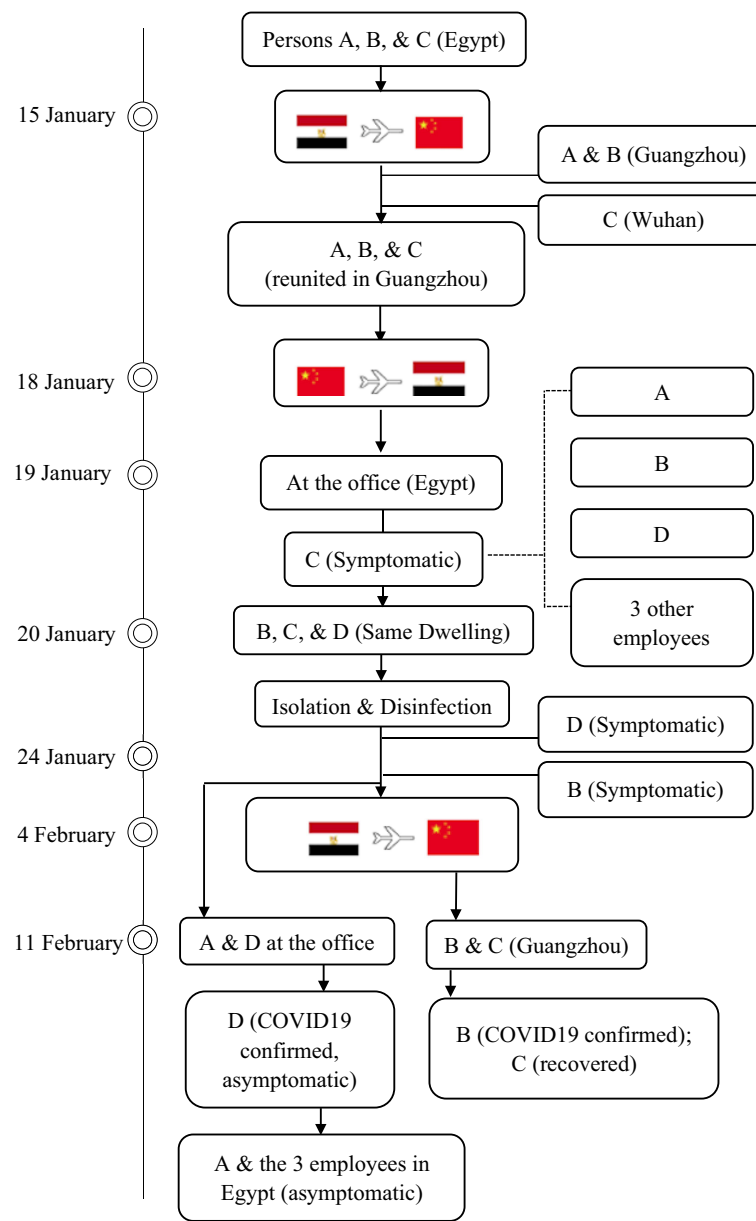


Figure 1. Timeline of early SARS-CoV-2 transmission in Egypt, 2020.

throat swabs for SARS-CoV-2 testing at the Egyptian Ministry of Health, which then had the capacity to do the testing. Mr D (the Chinese manager who shared the same house as the two afflicted managers who had returned to China, Ms B and Mr C) tested positive (Figure 1). Mr D was completely asymptomatic and is the first documented COVID-19 case in Egypt. As of March, Ms A has remained uninfected and asymptomatic.

Discussion

These cases illustrate the global dynamics of the coronavirus pandemic, in particular how modern business and air travel can transmit viral pathogens to far-distant venues.^{6,7} Ms B did not

travel to Wuhan, but was presumably infected by Mr C who did travel there (Mr C was a presumptive case, but remains unconfirmed). Mr D was exposed and infected in the shared dwelling or workplace but was asymptomatic. The heterogeneity of risk is highlighted by Ms A, who was exposed for prolonged periods to Mr C and Ms B during travel and at the workplace, but was never infected, as well as three other employees, also exposed for many hours in the workplace, but never infected (Figure 1).

Although the reporting of early symptomatic cases was urged by the Egyptian Ministry of Health from the very start of the pandemic, unidentified cases—either symptomatic or asymptomatic—contributed substantially to further SARS-CoV-2 spread nationwide and abroad.⁸ At a time of no local

testing capacity, COVID-19 cases were imported to Egypt from China through global air travel.⁹ Eventually the COVID-19 pandemic led to cessation of most international flights between afflicted countries, although it was too late to prevent global viral spread.¹⁰ Egypt, Algeria and South Africa represented the highest importation risk of COVID-19 from China to Africa according to one modelling study of global travel patterns.⁷ Egypt stopped all flights in late March through 1 July and applied a night-time curfew to limit the spread in social groups. Despite early, aggressive and restrictive control measures, Egypt has experienced a transition from its first few cases to a severe upward spike with cumulative cases of >70 000 (as of July 2020) after mass gatherings for festivals and loosened enforcement of physical distancing.¹¹ More cases are emerging in Africa and the Middle East and these will burden underresourced hospitals and health systems, representing a special risk for the elderly and persons with pre-existing medical conditions.^{3,4,12,13} The global community was not prepared for a pandemic respiratory disease threat on the magnitude of COVID-19, or novel influenza strains, least of all low- and middle-income countries.¹⁴

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